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USDA Seed Donation Jumpstarts Ug99 Resistant Seed Production

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Approved By:
Michael Ward
Prepared By:
Javed Sidiqi

Report Highlights:
During 2010, USDA worked with U.S. Central Command and U.S. Forces-Afghanistan to deliver 150 tons of Ug99 rust resistant wheat seed to Afghanistan. The seed arrived in October 2010, entered Afghanistan's seed multiplication program and was given to private seed enterprises as registered seed for production into certified seed. After site visits, the Office of Agricultural Affairs forecasts that the 150 ton donation will be multiplied into 4,200 tons of certified seed during the current growing season. The seed will be distributed to farmers for planting in the fall of 2011.

Executive Summary

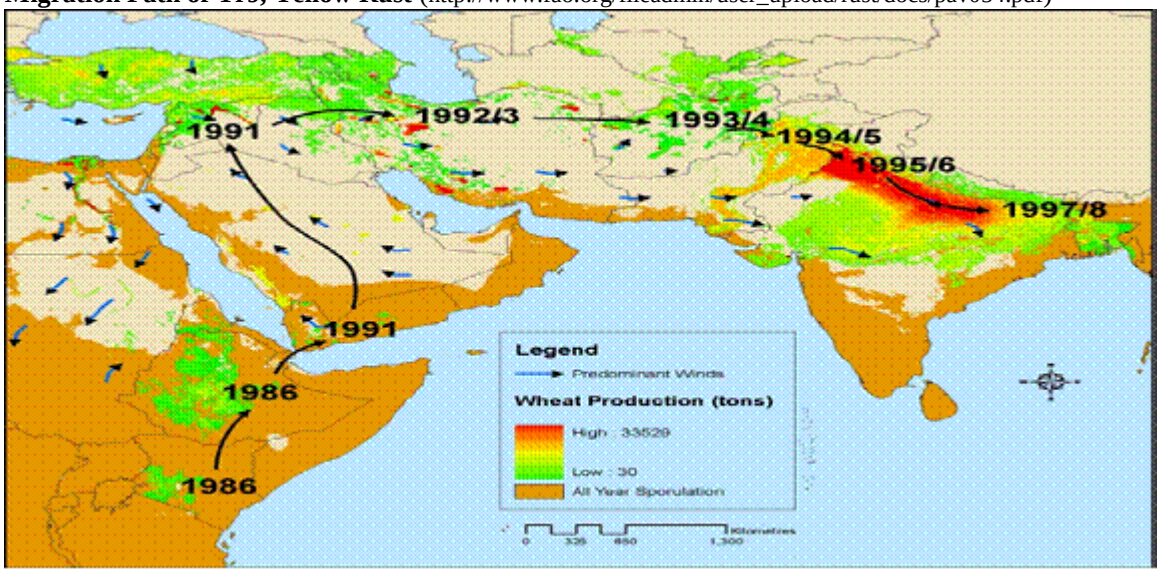
USDA's 150 ton donation of Ug99 rust resistant, high-yielding wheat seed, known as Maquwim-09 in Afghanistan, will be multiplied into an estimated 4,200 tons of certified seed for distribution to 84,000 farmers. This is the first release of Ug99 resistant seed to Afghan farmers. This will plant an estimated 40,000 hectares during the 2011-12 growing season. Production of Maquwim-09 seed will continue in future years due to cultivation of saved seed and additional Maquwim-09 in the seed system. Area under cultivation of rust resistant varieties will continue to grow as Afghanistan's seed system improves.

Background

Wheat is the staple crop in Afghanistan, grown on 70% of agricultural area cultivated and making up an estimated 50% of an Afghans annual caloric intake. However, the country's wheat production routinely does not meet demand and is subject to sizable weather, pest, and disease-induced fluctuations. One such disease, a fungus called Ug99, poses a very serious, immediate threat to Afghan wheat production and food security. Ug99 is a form of stem rust – first found in Uganda in 1999 – and has broken down the genetic resistance in wheat varieties.

Since 1999, Ug99 has travelled up the east coast of Africa, jumped the Red Sea, and is now found in regional pockets of Iran. Afghanistan now stands in the eastward path of Ug99 and remains largely vulnerable to possible outbreak of the disease due to high susceptibility of current wheat varieties being grown in the country. International wheat researchers and government experts predict that stem rust (Ug99) will follow the same migration travel path as yellow rust, (*Yr9*) did between 1986 and 1993/4. Using the model, Ug99 could arrive Afghanistan any season now.

Migration Path of Yr9, Yellow Rust (http://www.fao.org/fileadmin/user_upload/rust/docs/pav054.pdf)



Protecting Wheat Fields from Ug99

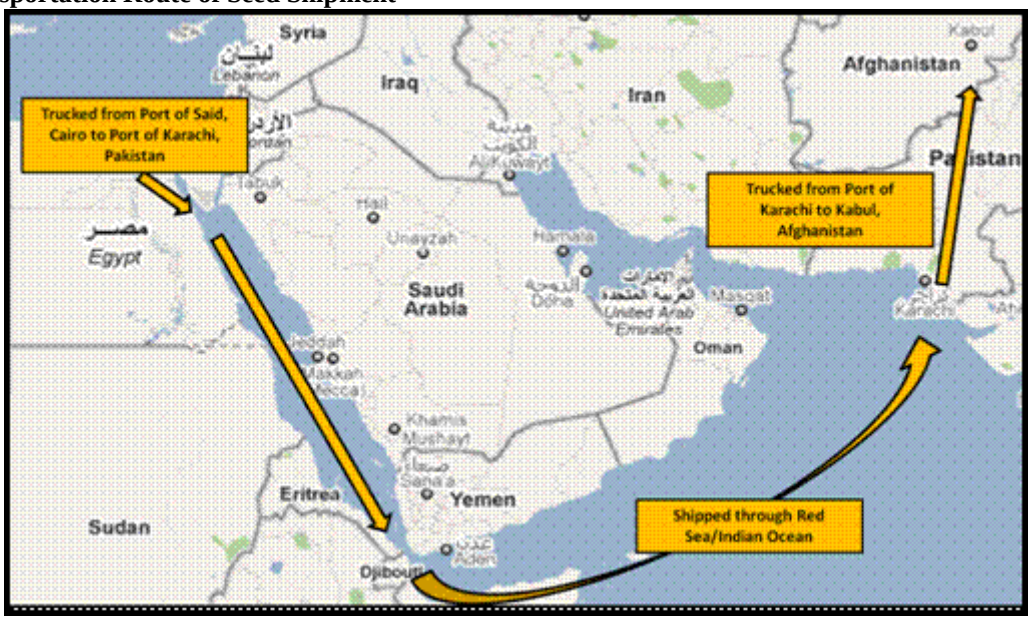
Afghanistan has a developing crop improvement infrastructure which includes both government and private sector production facilities. Presently the country lacks the human capacity and infrastructure to develop high-yielding, resistant cultivars and propagate volumes of certified seed for farmers. The country continues to depend on previously released wheat varieties (some which are vulnerable wheat diseases) and a number of cultivars introduced by the International Wheat and Maize Improvement Center (CIMMYT) and ICARDA (International Center for Agricultural Research in Dry Areas) that were testing in other countries and have been released in Afghanistan following adaptation and yield tests.

Recognizing the importance of wheat to Afghan farmers, USDA, in cooperation with CIMMYT, the Afghan Ministry of Agriculture, Irrigation, and Livestock (MAIL), and the U.N. Food and Agriculture Organization (FAO) have jump started the production of Ug99 resistant seed in Afghanistan by bringing in two shipments of approved seed from Egypt. In 2009, USDA partnering with CIMMYT and FAO brought in 1.5 tons of Misr-1, a high-yielding, rust resistant irrigated variety, released in Afghanistan as Maquwim-09 from Egypt for further multiplication.

The 1.5 tons brought in during 2009 performed very well according to MAIL, FAO and CIMMYT producing 27 tons of seed at the breeder, foundation, and registered seed classes. The variety yielded 20 percent more grain than the varieties currently grown in Afghanistan. Based on this shipment's performance, MAIL requested USDA assist in bringing an additional 150 tons of Misr-1 in for planting in the fall of 2010. This seed was planted as registered seed (the seed class immediately before release to farmers).

USDA working with U.S. Central Command and U.S. Forces-Afghanistan facilitated the acquisition and transport of 150 tons Maquwim-09 at the registered seed class. USDA's Agricultural Research Service working with the Foreign Agricultural Service's Office of Agricultural Affairs in Cairo utilized the longstanding relationship with the Egyptian Ministry of Agriculture and Land Reclamation facilitated the transfer of 150 tons of Misr-1 seed for transport through the U.S. military's transportation logistics.

Transportation Route of Seed Shipment



U.S. Forces-Afghanistan through a Commander's Emergency Response Fund project paid for the transportation of the seed. In an extraordinary example of civilian-military coordination, two USDA agencies (the Agricultural Research Service and Foreign Agricultural Service) partnered with U.S. Central Command to deliver the seed in time for fall planting.

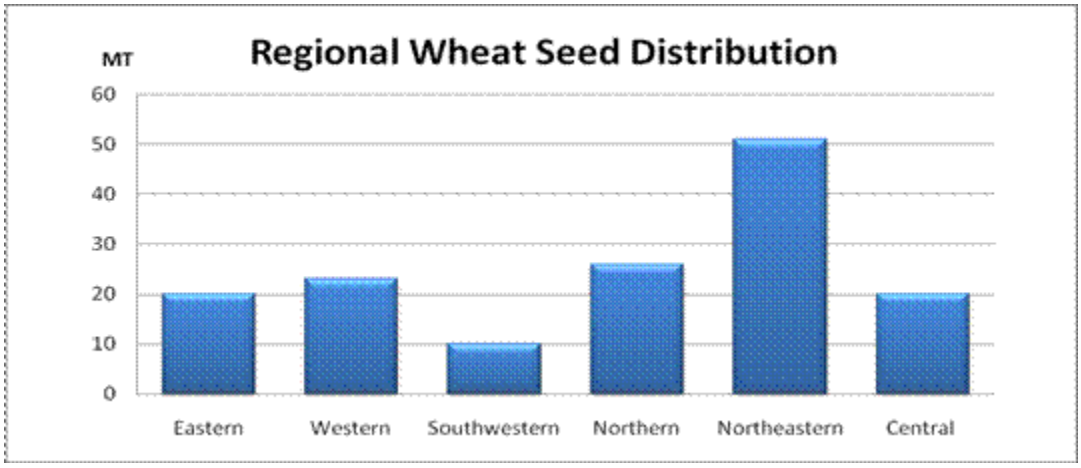
Unloading the Seed At Badam Bagh Farm in Kabul

To ensure that the seed was distributed throughout the country in a manner which reflected regional vulnerability to rust and productivity, MAIL's Improved Seed Enterprise stem (ISE) in cooperation with the Foreign Agricultural Service's Office of Agricultural Affairs in Kabul developed a detailed distribution plan to allocate seed to ISE's 6 regional multiplication centers. From these centers Private Seed Enterprises would receive the seed for planting.

U.S. Ambassador to Afghanistan Karl Eikenberry and Afghan Agriculture Minister Asif Rahimi Load Seed At Badam Bagh Farm in Kabul

Status of USDA Seed Donation and Maquwim-09 Certified Seed Production

The Improved Seed Enterprise Department of MAIL distributed 150 tons registered Maquwim-09 seed to 52 seed companies in 19 provinces through the Afghan National Seed Organization (ANSOR) for multiplication purposes. The seed has been grown by contract seed growers on 1,048 hectares during the 2010-11 growing season. After harvest in late May 2011, the seed will become part of MAIL's national wheat seed distribution, a program which supplies certified wheat seed and fertilizer to farmers as a subsidized cost.



Source: ANSOR

Despite early season ephemeral drought in most parts of the country, the overall growth of Muqawim-09 wheat variety planted in fall of 2010 in Western, Central and Northern Afghanistan was quite satisfactory. The growth of wheat plants was vigorous in their heading stage in the field in comparison to improved local varieties. No adverse factors such as flood, frost, weeds, pest and disease were observed in the fields. However, late planting of seed in some parts of Balkh province has resulted in late growth and some fields were still in the stem extension stage while early planted wheat was almost close to the flowering stage.

USDA's Office of Agricultural Affairs in Kabul conducted field visits to Herat, Balkh and Parwan provinces in late April to assess performance of USDA's donation. Three seed companies that had received the largest amount of registered Maquwim-09 seed in their respective regions were selected for the field visit.

Maquwim-09 in Herat Province

Wheat field (Maquwim-09) in Balkh Province

While seed companies and farmers are optimistic and expect good yields considering healthy and strong vegetative growth of Muqawim-09, they reported the average seed multiplication rate in Afghanistan is believed to be at 1kg = 28kg in a normal growing season. This calculation is based on average agronomic performance of current local varieties. At this rate of seed multiplication, it is expected that Maquwim-09 variety to produce up to 4,200 tons of certified seed to be distributed to the farmers for planting in the fall of 2011. It is estimated that around 84,000 farmers will receive stem rust resistant seed for planting in the fall.

Afghanistan produced 18,000 tons certified wheat seed by Private Seed Enterprises in 2010, none of this seed was resistant to Ug99 stem rust. It is estimated that around 30,000 tons of certified wheat seed will be produced in 2011. Maquwim-09 will account for 14% of certified seed distributed to farmers putting the country in a relatively good position to take pre-emptive measures to protect wheat fields from Ug99 in vulnerable provinces. With additional rust resistant seed in the multiplication pipeline, the amount of rust resistant seed made available to farmers each year will continue to increase.

Estimated Volume of Maquwim-09 in Seed System

Class	MT(after 2011 harvest)	MT(after 2012 harvest)
Breeder Seed	11	
Foundation Seed	160	330
Registered Seed	105	4,800
Certified Seed	4,200	2,940

USDA Estimate Based On FAO Data

Future Prospects

In 2010 MAIL approved a new rust resistant variety called Chonte-10 for cultivation and multiplication. The continual evaluation and approval of new varieties is incredibly important because resistant varieties can be overcome and be susceptible to rust. The Afghan Agriculture Ministry must continue to engage the international community to evaluate and approve new resistant varieties and expedite the multiplication of those varieties ensuring they reach farmers as quick as possible. The evaluation and approval of this new variety shows that MAIL continues to be proactive in modernizing the wheat sector in Afghanistan.